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Actiniæ may be easily preserved expanded and intact, and Hydroids of all genera yield good specimens. The transfer to fresh sea-water is the only point requiring care. No time limit can be given, as the factors are too variable; but a little practice is sure to show the character and advantages of this method.—H. B. WARD, *Cambridge, Mass.*

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

Boston Society of Natural History.—December 3d, 1890.—Dr. J. Walter Fewkes spoke of "The Summer Ceremonials of the Zuñi Indians: a Study of Aboriginal Religion."

December 17th.—Prof. A. E. Dolbear read a paper on "The Physics of Crystalline and Cellular Structure." A communication on "Kame Ridges and Hillocks of Hingham," by Mr. T. T. Bouvé, was also presented.

January 7th, 1891.—Business: Election of members. Final action on the proposed new by-laws was taken by the society. Mr. J. G. Owens read a paper on "A Few Games of the Zuñi Indians."

January 21st.—Prof. A. E. Dolbear read a paper on "The Physics of Crystalline and Cellular Structure."

February 4th.—Mr. G. H. Barton described "The Hawaiian Islands: Their Natural History and Inhabitants." The paper was illustrated with a stereopticon. Mr. J. H. Emerton exhibited a new model of Oahu, which he has lately made for the museum of the society.

February 18th.—Mr. Warren Upham spoke of "Walden, Cochituate, and other Lakes Enclosed by Modified Drift." Prof. W. H. Niles presented a paper on "Notes upon Asphaltum Deposits in California."

March 4th.—Prof. W. M. Davis presented a paper entitled "Illustration of the Faulted Monoclinal Structure and Topographic Development of the Triassic Formation of Connecticut by a Working Model." Prof. N. S. Shaler spoke on the "Antiquity of the Glacial Period." Prof. Shaler called the attention of the society to the Dorkin photographs.

March 18th.—Dr. G. Baur read a paper on "The Importance of a Scientific Investigation of the Galapagos Islands." Prof. W. O. Crosby made a communication "On the Colors of Soils."

April 1st.—Dr. H. C. Ernst spoke on the latest developments in the "Germ Theory of Disease," illustrated by stereopticon and exhibition of tube-cultures.—J. WALTER FEWKES, *Secretary.*

Biological Society of Washington.—December 13th, 1890.—The following communications were read: The Occurrence of an Asiatic Cuckoo on the Pribylov Islands; Mr. William Palmer. New Notes on the Genus Phylloxera; Prof. C. V. Riley. The Teeth of the Muskrat; Mr. F. W. True. The Wing of Metopidius; Mr. F. A. Lucas.

December 27th.—The following communications were read: A Preliminary Study of Ticks in the United States; Dr. Cooper Curtice. Exhibition of a New Rabbit from the Snake Plains of Idaho; Dr. C. Hart Merriam. On the Topography of Florida, with Reference to Its Bearing on Fossil Faunas; Mr. W. H. Dall.

February 7th, 1891.—The following communications were read: Discovery of Vertebrate Life in Lower Silurian (Ordovician) Strata; Mr. C. D. Walcott. A Review of the Discovery of the Cretaceous Mammalia; Prof. Henry F. Osborn.

March 7th.—Communications: Exhibition of Young Hoatzins; A Specimen of *Bison latifrons* from Florida; Mr. F. A. Lucas. The Fishes of Great South Bay, Long Island; Dr. T. H. Bean. A New Aster from Southern California; Mr. J. N. Rose. Color and Odor of Flowers in Attracting Insects; Mr. Geo. B. Sudworth. Embryo of a Chick with Two Protovertebræ; Mr. J. M. Stedman.

March 21st.—Dr. W. H. Dall spoke upon the "Age of the Peace Creek Bone-Beds of Florida." Reference was made to the discovery of bones of various sorts by the Coast Survey and other exploring parties, while the recent explorations for phosphates have brought many more to light. In some counties the sticky clay containing the bones occurs in cavities of Eocene and Miocene rocks. The occurrence of bones in these localities indicates that the animals had become mired in attempting to cross swampy ground; and their appearance indicates that they had been gnawed by carnivorous animals. Evidences of fire are also present, but it was considered that lightning, and not man, was the probable cause. Some authors called the strata containing the bones Miocene, some Pliocene, and some Quaternary.

The bones found are those of the Elephas, Rhinoceros, Mastodon, Llama, Deer, Hippotherium, Equus, Tiger, Tapir, Buffalo, Megatherium, Megalonyx, Glyptodon, Porpoise, and Alligator, besides many fish fragments. Professor Cope had made a comparison between the Florida remains and those of the west, particularly the Loup Fork beds, of Miocene age. Some forms, however, were similar to those of the Equus beds, of Pliocene age. The Florida remains were, Cope thought, of an epoch between the Loup Fork and the Equus beds.

Dr. Dall stated that he had lately visited the Peace Creek locality for the special purpose of settling the age of the deposit. He explained the method of dredging for the phosphate in the river, stating that 200 tons per day were obtained. It is mostly in the form of pebbles about the size of marbles. Above Arcadia he found a section along the river bank which showed a bed with the bones *in situ*. The layer was about 1½ feet thick, overlying strata of Pliocene age (as shown by marine shells); and the bone bed was in turn overlain by a deposit of phosphatic material. The bones, therefore, could not be older than the Pliocene, and as the marl above them was covered in turn by a stratum which also contains Pliocene marine fossils, the conclusion was inevitable that the bone beds of that locality, at least, were of Middle Pliocene age.

Dr. R. W. Shufeldt read a paper "On a Collection of Fossil Birds from the Equus Beds of Oregon," from the collection of Prof. E. D. Cope. He first described the features of Silver Lake, a beautiful sheet of water frequented by great numbers of water birds. "Fossil Lake" was the bed of a dried-up lake, not many miles distant; and in the fine silt of this locality many bird remains had been discovered by Prof. Condon and Prof. Cope. He thought there were at least twenty undescribed extinct species. Indian relics, implements of obsidian, were found in the same bed as the bird remains, though it could not be asserted positively that the two were contemporaneous.

Mr. F. A. Lucas spoke of the anatomy of Hesperornis, the gigantic, extinct, toothed bird. He compared it with various living birds, and concluded the evidence indicated a foot patterned after that of the grebe, but more highly specialized. With Marsh he did not think it was a land bird, or that it used its wings in swimming, but that it was a highly specialized aquatic.

Mr. F. H. Knowlton discussed the function of cypress knees. He referred to the idea advanced in 1848 that these knees, which vary in height from one inch to two, four, and even ten feet, performed the function of aëration. This idea had been later on fully elaborated by Prof. N. S. Shaler. Another theory, advanced by Dr. Lamborn, is that the knees buttress the trees, and so prevent violent winds from uprooting them. The latter idea seemed very plausible, as it was an undoubted fact that no one had ever seen an uprooted cypress tree. Prof. Shaler had contended that when the knees were submerged the tree invariably died, but this was stated not to be the case.

Prof. L. F. Ward, in discussing the paper, expressed his disbelief in the theory that the knees were for the purpose of increasing the areating surface. He described the appearance they presented, and stated his belief that they certainly furnished support to the tree in many cases. He questioned the fact of this being their original purpose, but thought it might be the after result. He mentioned a tree planted by Bartram, near Philadelphia, which grew in dry ground, and had knees 100 yards from the trunk. This tree was probably one hundred years old, and had never grown in or near the water. He advanced the idea that the knees were only aborted shoots, thrown up from the roots like the suckers of the silver poplar and ailanthus. Water he did not consider necessary for the growth of the knees. He had not seen any tree actually arising from a knee and so connected with the parent, but he believed investigation would show that the knees were of the nature of aborted sprouts.—JOSEPH F. JAMES.

Proceedings of the Natural Science Association of Staten Island.—November 8th, 1890.—This being the annual meeting, reports of officers for the past year were read and accepted. The treasurer reported an income of $168.08 and expenses amounting to $116.83, leaving a balance of $51.25 in the treasury.

The election of officers for the ensuing year resulted as follows: President, Dr. N. L. Britton; treasurer, Eberhard Faber; recording secretary, Chas. F. Simons; corresponding secretary, Arthur Hollick; curator, Jos. C. Thompson.

Dr. Britton alluded to his recent proposition (see Bulletin Torrey Botanical Club, Vol. XVII., p. 121) to recognize plants which, with greater or less frequency, bear flowers of a color other than the normal hue under the rank of "forms," the difference not being sufficient to class them as varieties. Thus the common salt-marsh pink (*Sabbatia stellaris*), whose flowers are normally red, occasionally produces them of a pure white color, and this albino condition was therefore described under the name *Sabbatia stellaris* forma *albiflora*. This form has recently been collected in considerable quantity in the meadows back of South Beach, where it grows with the ordinary red-flowered form, and in certain patches is equally abundant. Another salt-marsh species of this genus (*S. dodecandra*), observed by Mr. Eadie at Old Place, and by Mr. Hollick at Kreischerville, has not yet been reported in the albino form from our region, but has been noticed in New Jersey.

The painted cup (*Castilleia coccinea*), which formerly grew in large quantities in the Cove Lake swamp, but is now to a considerable extent obliterated there, usually produced some plants with orange or yellow bracts, their ordinary color being scarlet. The same occurrence has been reported in other districts.

Some years ago Mr. Hollick collected a plant of the New England aster (*Aster novæ-angliæ*) at West New Brighton, which, instead of having the ordinary purple rays, had them rose-colored. This had been described by Dr. Gray as var. *roseus*, but it manifestly falls into the rank here alluded to as "forms," and I should propose to call it *A. novæ-angliæ* forma *roseus* Gray.

Mr. Hollick exhibited specimens of lignite and pyrite from the recently opened fire-clay beds at Green Ridge. This clay has been mined in this locality to a depth of about thirty feet. It is covered by from six to ten feet of drift, and is undoubtedly of Cretaceous age, the same as the Kreischerville clays, the two no doubt being continuous. About three-fourths of a mile to the eastward, at Fresh Kills, drift clay is being mined to as great a depth, but there is as yet no indication of the Cretaceous clay being near at hand. Both these localities were visited on election day on the occasion of the annual field day with the Torrey Botanical Club and Brooklyn Institute, at which time the specimens were collected. Mr. Hollick also reported that on the same day a new locality was discovered for wintergreen (*Gaultheria procumbens*), near Giffords, where there was a large patch full of berries.

March 14th, 1891.—A paper was read by Mr. Charles W. Leng, "Notes on Some Species of Donacia," as follows:

It has been my task during the past few months to make a revision of the genus Donacia, in the prosecution of which I have, with the assistance of my fellow coleopterists, Messrs. Davis and Thompson, collected considerable numbers of those species inhabiting Staten Island. Their specific identity has thus become known to me, and certain facts respecting their habits which have not been elsewhere definitely recorded seem to be proper matter for these proceedings.

There are about twenty species inhabiting the United States and Canada, of which five only are known to occur here. It is possible, however, that additional species may be found by sweeping damp meadows with a net in June and July, a method not adopted by us last year.

The genus is quite homogeneous, and the species are indeed so much alike that most collections are in some confusion. The body beneath is more or less flattened and densely clothed with decumbent hairs, lustrous and resembling silk or satin, according to the fancy of the describer. These hairs serve as a protection against the moisture to which their pond-frequenting habits expose the insects. The color above varies from coppery bronze to testaceous, more or less mottled with metallic green. The length is about half an inch. The antennæ and legs are comparatively long, and the variation in the length of the joints of the one and in the spinous processes which adorn the other afford the most convenient characters, combined with the form of the elytral apices, for the separation of the species. They may be known as follows:

- Prothorax not tuberculate, scarcely punctulate;
  - Third joint of antennæ little, if any, larger than second;
    - Elytra squarely truncate, *lucida.*
  - Third joint of antennæ at least twice as long as second;
    - Elytra squarely truncate, *palmata.*
    - Elytra more convex, subtruncate, *piscatrix.*
- Prothorax not tuberculate, coarsely, densely punctate;
  - Third joint of antennæ little longer than second;
    - Elytra squarely truncate, *subtilis.*
- Prothorax evidently tuberculate, scarcely punctate;
  - Third joint of antennæ little longer than second;
    - Elytra more convex, subtruncate, *tuberculata.*

In addition to the above, the sexual characters assist in separating the species. All the males have the last dorsal segment, called the pygidium or podex, short and truncate; the females have the same part longer and rounded at apex. The male of *lucida* has the posterior femora spinose, often armed with two or three spines; the female has but one spine. The sexes of *palmata* and *piscatrix* differ similarly in the femora; the male *palmata* is further distinguished by a dilation of the first joint of the anterior tarsi, and the male of *piscatrix* by an excavation of the first ventral segment. The sexes of *subtilis* differ but little; both have the posterior femora unidentate. The male of *tuberculata* has but one spine, but the female is without any.

From the results of last season's collecting I am satisfied that the above-described species affect different aquatic or subaquatic plants; the first three appertaining to the water-lilies, *subtilis* to the rushes growing at the pond margin, and *tuberculata* to the Sagittaria. The evidence I have is as follows: Our collections were made principally at Britton's ice pond, at the small pond on top of Todt Hill, and at Butler's or Galloway's pond near Garretson station. In all of them the yellow water-lily grows abundantly, mingled with the white water-lily, but only at Butler's pond do gradually shelving banks afford the marshy stretch necessary to a free growth of the rushes. At all of these ponds the first three species of Donacia were abundant, but only at Butler's did we find *subtilis*. At that pond were many specimens, some resting on the lily pads, but the greater number on the stalks of the rushes. (Identified by Mr. Arthur Hollick as *Juncus effusus* L.) Mr. C. M. Weed, in the Bull. Ohio Ex. Sta., Oct., 1889, describes the abundance of *subtilis* in a similar situation near Columbus. My friend, Mr. E. M. Hulbert, tells me it is abundant near New Britain on sweet flag, and "no water-lilies within a mile, and no other species found."

In regard to *lucida*, *palmata*, and *piscatrix*, all three have been taken often on the leaves of the lilies and within the flowers, and there is a further confirmation of their lily-frequenting habits derived from an observation of the roots of that plant. In the operation of cleaning the ponds for winter, the icemen drag out the ranker growth of lilies and throw them, roots and all, on the banks. I have found in November oval cases of a thin but tough material attached to these roots and containing Donaciæ in the imago and larval stages. These cocoons are waterproof, and enable the beetle to pass the winter under two or three feet of water, or perhaps, when near the bank, imbedded in ice.

The larvæ of our American Donaciæ have not been described, and though I have dried specimens I cannot venture to make a complete description. They appear to be whitish grubs, about half an inch in length, with the head darker, but not otherwise conspicuous. The body appears to taper slightly beyond the head.

I have searched about the plants inhabited by *subtilis* for similar cocoons, but hitherto unsuccessfully. Many of the stems are now eaten, possibly by its larva, and among the roots are empty cases, but these might have been washed up from the pond.

The last species, *tuberculata*, is known to us on Staten Island by a single specimen taken on Sagittaria. It was however, taken in numbers by Mr. Davis and myself in the cranberry bog at Jamesburg, N. J., on the same plant. Water-lilies occurred a few hundred yards away, and on their leaves were a few specimens of *lucida*, but on the Sagittaria only *tuberculata*.

The life-history indicated by these observations is certainly a curious chapter in coleopterology. The parent beetles hover about the food plant proper for their offspring. They lay thereon their eggs, and the larvæ hatching, eat and grow fat until the approach of winter warns them to prepare the waterproof case for their coming transformation, within which the perfect insect develops and lies dormant until the following summer, when he emerges to repeat the cycle. It is, of course, no more than all the butterflies do, but possesses a special interest from the accompanying adaptation to an aquatic career.

Mr. Arthur Hollick presented a specimen of soapstone rock from the Clove road outcrop, showing well preserved glacial striations, or possibly "slickenside" markings, neither of which had been previously noted from such rock, probably on account of its being so soft and easily weathered.

January 10th, 1891.—Mr. Arthur Hollick read the following notes upon additions to the flora of the Island, illustrated by specimens:

Since the last appendix to the "Flora of Richmond County" was published, about two years since, a number of important finds have been made. Some of these are of plants not previously found on the Island, others are of plants which had been previously reported but not verified by specimens, while others are of importance as new localities for rare species. I take pleasure in acknowledging our indebtedness to the members of the Torrey Botanical Club, who are responsible for seven of the finds, discovered during several field-day excursions to the Island.

Ranunculus lacustris Beck and Tracy. Abundant in a pond on Ocean Terrace, near the Vanderbilt mausoleum; only known previously from a pond near Court House Station.

Tilia americana L. Richmond (Wm. T. Davis.) These trees were discovered May 30th, 1888, but it was not until the following year that the flowers were obtained and the species positively identified. The trees are few in number, and grow in the woods near the defunct North and South Shore R. R. So far as we know, they are the only native lindens on the Island.

Euonymus europæus L. Escaped along a roadside near Richmond Valley.

Eupatorium hyssopifolium L. Pleasant Plains.

Aster radula Ait. Arlington. (Dr. R. G. Eccles.)

Hieracium aurantiacum L. Rossville; in grassy ground, near the shore.

Veronica chamædrys L. Prince's Bay. (Mrs. N. L. Britton.)

Salix purpurea L. Abundant along roadsides near Rossville. Probably the relics of old basket-willow plantations.

Habenaria ciliaris (L.) R. Br. Old Place (Wm. T. Davis) and Bogardus's Corners.

Habenaria blephariglottis (Willd.) Torrey. Arlington. (Dr. R. G. Eccles.)

Microstylis unifolia (Michx.), B. S. P. Near Egbertville (Mrs. N. L. Britton), and Ocean Terrace, near Four Corners. This inconspicuous little orchid has recently been found in comparative abundance at both localities, and may probably be looked for in similar situations elsewhere. It was admitted into the original "Flora of Richmond County," published in 1879, upon the strength of a single rather poor specimen found by Judge Addison Brown "in a glen near New Dorp," and until another specimen was found by Mrs. Britton about three years ago this was the only voucher which we had to show as evidence of its occurrence here.

Liparis lœselii (L.) Rich. Garrettson's; one specimen only. (Miss Millie Timmerman.) This species was admitted into the original catalogue on the authority of I. H. Hall, in the Bulletin of the Torrey Botanical Club for April, 1874, where there is a note to the effect that it was found "on Staten Island, in the gravelly bank of a railroad cutting."

Cypripedium acaule Ait., forma *alba*. A single specimen of this albino was found by Mrs. Edward Heylyn. The exact locality is not known to me.

Belamcanda chinensis (L.) Red. Tottenville; along a brook.

Tradescantia virginica L. Bogardus's Corners; evidently spreading.

Eleocharis palustris (L.) R. Br., var *glaucescens* (Willd.) Gray. Common.

Scirpus olneyi Gray. New Dorp.

Glyceria distans (L.) Wahl. New Dorp.

Panicum miliaceum L. Todt Hill road, near Moravian Church.

Association of American Anatomists.—The next meeting will be held at Washington, D. C., in September, 1891, at or about the time of meeting of the Congress of American Physicians and Surgeons. The officers for that meeting are as follows: President, Joseph Leidy; vice presidents, Frank Baker, F. D. Weisse; secretary and treasurer, D. S. Lamb; executive committee, Harrison Allen, Thomas Dwight, and B. G. Wilder.